CHAL 0249
Cy 2 of 5

22 July 1958

MEMORANDUM TO: DIRECTOR OF OPERATIONS

SUBJECT : Pilot Seat Ejection System Utilization

1. Prior to the advent of installing a Pilot Seat Eject System in project aircrafts, Headquarters established a directive on installation and utilization of the ejection seat as follows: "The ejection seat is to be installed for all flights except those flights which involve actual penetration missions."

25X1 2. As a result of recent receipt of seat ejection modified aircrafts at [redacted], the following information has been received from these detachments.

25X1 a. [redacted] "I would like to have it (seat) available for overflights if possible. The ejection seat is highly desirable. Use of seat on penetration mission should be as directed by the situation."

25X1 b. [redacted] "For morale and standardization reasons, we wish to use the same seat as will be used for operational mission for all flights." (By operational they refer to the standard seat)

3. If Headquarters is to maintain its present seat utilization policy, "B" detachment will tend toward non compliance and use the standard seat exclusively. Also, by maintaining this same directive, "C" detachment will be denied fulfillment of their considerations and
25X1 suggestions as expressed in [redacted] (See par 2.a. above)

4. Considerations: (Original Concept)

Weight penalty of seat	= 53 lbs.
Estimated altitude loss	= 53 ft.

Due to the smaller size of the seat pack used in the ejection seat, the survival components are fewer and therefore weigh less—more realistic figures would be:

Weight penalty of seat	= 53 lbs.
Weight saved on smaller seat pack	= 15 lbs.
Total weight penalty	= 38 lbs.
Altitude loss	= 38 ft.

Comfort - The new seating arrangement is considered to offer seating comfort favorable to the old seat. ?

Flight Safety - W/O the ejection seat, a successful egress is doubtful. With the seat, and in obeyance of proper procedures already published and forwarded to detachments, successful egress is favorable.

Psychological Aspect - The pilots have since their original check-out flight expressed a continued disturbance at the omission of an ejection seat in the project aircraft. They consider unassisted bail-out as virtually impossible and ditching or rough terrain forced landing as conducive to personal ruin. The ejection seat will negate their expressed fears and satisfy their desires for a safe and facile way of evacuation.

Range - Off loading fuel to adjust gross take off weight to offset the weight penalty of the ejection seat results in decreasing the T. O. fuel quantity by 6 gallons. Though this procedure would produce the same basic flight altitude profile as when using the standard seat, it would result in a loss of 3.6 minutes of fuel duration and approximately 24 nautical mile range.

Vulnerability - Intelligence information indicates that the highest foreign effective intercept capability is 62,900 ft. with a somewhat higher ineffective altitude achievement through limited flight stability "zooming." Assuming reliability of this information, a significant edge of altitude superiority remains in our possession. The loss of 38 ft. from peak altitude seems negligible at present in the light of this information.

SUMMARY: The disadvantage of using the ejection seat in the U-2 lies in the altitude loss penalty which amounts to approximately 38 ft. None other are apparent even though a comfort compromise was at first anticipated. The altitude loss may be exchanged for flight duration and range compromise by readjusting the Take Off fuel load to compensate for the weight of the ejection seat. (approximately 6 gals. of LFIA) This results in the loss of 3.6 minutes of flight and 24 nautical miles.

The advantages stated briefly are in providing a safe method of evacuation and psychological assurance to the pilot.

RECOMMENDATIONS: Headquarters has directed that the ejection seat be used on all flights excepting flights involving penetrations. This directive was based on an understanding that the ejection seat is of great benefit

to flight safety but too costly in altitude limitation to afford that safety in penetration flights. Altitude advantage has been and still is our only defense. Now that the degree of altitude loss resulting from ejection seat installation has been determined as not being as excessive as originally anticipated, it is felt that the prevailing firm Headquarters policy could be modified. It is recommended that that part of the policy requiring ejection seat installation for training, ferrying, weather and peripheral flights be left unchanged. That part of the policy dictating standard seat installation for penetration flights could be changed to read, "type seat installed for penetration flight to be determined by mission duration, range and gross weight situation and subject to Commander's judgment and Pilot's desires.

25X1

Aviation Physiologist

DPS/DCI/RJT:aem

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